In The Claims

Kindly enter the claim amendments, without prejudice, as set forth below. A complete listing of the claims is provided, with a parenthetical indication of the status of each claim and markings to show current changes.

CLAIMS

1. (currently amended) Injector-burner comprising a cylindrical body (3) defining a first longitudinal axis (6), the cylindrical body comprising

a first central duct (8) arranged along said first axis (6)~~-~~,

at least one second~~,~~ ring-shaped duct (10), arranged around said first central duct (8),

a third ring-shaped duct (9), arranged around said second ring-shaped duct (8),

a head (2), fixed to one end of said body and provided with at least one first central hole (7), coaxial to the first longitudinal axis (6) and connecting said first central duct (8) with the outside of the cylindrical body (3),

the head (2) being provided with second and third through holes (5) connecting respectively said second and third ring-shaped ducts (9, 10, 11) with the outside of the injector-burner,

~~each~~ the second through holes (5) defining ~~second respective~~respective second axes,

wherein each second respective axis ~~forming~~ forms a first angle with a plane passing through the first axis (6) and ~~the~~ an intersection point of ~~the~~ said second respective axis with ~~the~~ an external surface of the head (2) and ~~furthermore~~ wherein each second respective axis ~~defing~~ defines a projection on said plane~~,~~ forming a second angle with said first axis (6),

characterised in that the second and third through holes are divided into several groups, the groups being reciprocally separated by circular sectors of the external surface of the head without holes, whereby the circular sectors have their apexes on the first axis (6) and their angles are greater than the angular distance between two adjacent second through holes.

2. (currently amended) Injector-burner according to claim 1, wherein each of the said third through holes define respective third ~~respective axis~~ axes forming a first angle with a plane passing through said first axis (6) and the intersection point of ~~the~~ said third respective axis with the external surface of the head (2) and having a projection on said plane forming a second angle with said first axis (6).
3. (currently amended) Injector-burner according to claim 2 wherein one or several of said groups of second and third through holes (5) comprise holes whose axes have first angles with a value different from 0° and second angles with a value of 0°.
4. (currently amended) Injector-burner according to claim 3 wherein said several groups of second and third through holes (5) are placed on the burner head symmetrically and directed in respective diverging directions with respect to ~~its~~ the first axis (6) so that said several groups of second and third through holes (5) are suitable to produce respective flames in diverging directions and substantially symmetrical with respect to said first axis (6).
5. (currently amended) ~~The i~~Injector-burner according to claim 2, wherein said first and second angles of the respective axes of second and third through holes have a value comprised between 5 and 60°.
6. (currently amended) Injector-burner~~The injector-burner~~ according to claim ~~5~~6, wherein second respective axes and third respective axes~~,~~ crossover one another in pairs outside the injector-burner.
7. (currently amended) Injector-burner ~~The injector-burner~~ according to ~~any of the previous claims~~claim 6, wherein the second and third holes are distributed on two circular crowns concentric with the first axis (6) of the cylindrical body.
8. (currently amended) Injector-burner ~~The injector-burner~~ according to ~~any of the previous claims~~claim 7, wherein said first central duct (8), or the corresponding first central hole (7), ~~has a shaped~~comprises a portion having a shape of a converging or converging-diverging nozzle (15, 15').
9. (currently amended) Injector-burner ~~The injector-burner~~ according to claim ~~8~~9 wherein ~~the~~ an outflow of supersonic gas from the nozzle~~, with~~is provided with a variation in gas pressure along the length of the nozzle (15, 15') according to a

hyperbolic tangent function.

10. (currently amended) Injector-burner ~~The injector-burner~~ according to ~~any of the previous claims~~claim 9, wherein there is provided a fourth duct (16), inside the first central duct (8), and substantially coaxial with it, for supplying solid or liquid components, dispersed in a gas.

11. (currently amended) Injector-burner ~~The injector-burner~~ according to ~~any of the previous claims~~claim 10, wherein the second and/or third through holes are shaped to a converging or converging-diverging nozzle.

12. (currently amended) A method for introducing one or more gases into a melting furnace for metals, wherein said gases are introduced in the metal through an ~~injection~~ injector-burner according to claim 1~~any of the previous claims~~.

13. (currently amended) The method according to claim 12, comprising the step of supplying an oxygen-containing gas to the first duct of said injector-burner and~~,~~ a fuel-containing gas to the second or third duct, so as to generate a flame outside the injector-burner.

14. (currently amended) The method according to claim 13 comprising the step of ejecting oxygen-containing gas ~~containing oxygen~~ from the first hole of said injector-burner at supersonic velocity.

15. (currently amended) The method according to claim 14 comprising the step of making part of said fuel reach ~~part of said fuel reaching~~ unburnt a ~~metal~~ melt inside the furnace.

16. (currently amended) The method according to claim 12 comprising the step of supplying an oxygen-containing gas to the third duct of said injector-burner.

17. (canceled)

18. (currently amended) The method according to claim 12, comprising the step of supplying a fuel-containing gas to the third duct and an oxygen-containing gas to a second duct.

19. (currently amended) The method according to claim 12 comprising the step of supplying an oxygen-containing gas from the first duct of the injector-burner.

20. (currently amended) The method according to claim 19 comprising the step of ejecting gas from the first hole of the injector-burner at supersonic velocity.

21. (currently amended) The method according to claim 20, comprising the step of producing a coherent length of a~~the~~ gas jet from said first hole greater than the distance of the head of the injector-burner from the surface of a ~~metal~~ melt contained in the furnace.

22. (currently amended) The method according to claim 12 comprising the step of introducing a solid in form of powder or granules through the injector-burner~~'s~~ first duct ~~a solid in the form of powder or granules~~.

23. (currently amended) The method according to claim 22, comprising the step of introducing the solid together with a gas stream, whose outflow from the first hole of the injector-burner is subsonic.

24. (currently amended) The method according to claim 12, comprising the step of introducing a solid in the form of powder or granules through the fourth duct. ~~of an injector-burner, according to claim 9.~~

25. (currently amended) The method according to claim 12~~claims 12 or 16~~, comprising the step of supplying a fuel-containing gas to the first duct of said injector-burner in subsonic or supersonic regime.

26. (currently amended) The method according to claim 25 comprising the step of making ~~reaching~~ reach unburnt the surface of a ~~metal~~ melt inside the furnace.

27. (canceled)

28. (new) Injector-burner according to claim 4, wherein the second and third holes are distributed on two circular crowns concentric with the first axis (6) of the cylindrical body.

29. (new) Injector-burner according to claim 28, wherein said first central duct (8), or the corresponding first central hole (7), comprises a portion having a shape of a converging or converging-diverging nozzle (15, 15').

30. (new) Injector-burner according to claim 29, wherein an outflow of supersonic gas from the nozzle is provided with a variation in gas pressure along the length of the nozzle (15, 15') according to a hyperbolic tangent function.

31. (new) Injector-burner according to claim 30, wherein there is provided a fourth duct (16), inside the first central duct (8), and substantially coaxial with it, for supplying solid or liquid components, dispersed in a gas.

32. (new) Injector-burner according to claim 31, wherein the second and/or third through holes are shaped to a converging or converging-diverging nozzle.

33. (new) Injector-burner according to claim 32, wherein said injector-burner is mounted on a lance fitted with a mechanical arm.

34. (new) Injector-burner according to claim 11, wherein said injector-burner is mounted on a lance fitted with a mechanical arm.

35. (new) The method according to claim 14, comprising the step of supplying a fuel-containing gas to the second duct of the injector-burner.

36. (new) The method according to claim 16, comprising the step of supplying a fuel-containing gas to the first duct of said injector-burner in subsonic or supersonic regime.

37. (new) The method according to claim 36, comprising the step of making part of said fuel reach unburnt the surface of a melt inside the furnace.